Alaska Energy Cost Reduction Program
Progress Report

Grantee: Alaska Power & Telephone Company

Project Name: Alatna - Allakaket Intertie ECR

Authority Contract Number **2195228**

Grant Project Completion Report

Background:

Alatna and Allakaket, with a combined population of approximately 220 people, is located 190 air miles northwest of Fairbanks, and 57 miles upriver from Hughes. The Koyukuk River separates the villages, with Alatna on the northern bank and Allakaket on the southern bank of the river. Access is by boat to both villages or by air to the Allakaket Airstrip. Air travel is frequently interrupted or cancelled because of weather. The climate of this area varies greatly from 70 degrees Fahrenheit the summer to minus 75 degrees Fahrenheit during wintertime. The annual snowfall is 72 inches with 12 inches annual rainfall. Because of the dangers of flowing ice chunks and thin shelf ice, travel between the two villages is cut off for a couple of months in the late fall and late spring while the Koyukuk River freezes and thaws, with the river generally frozen over from November through May. All of the houses and community facilities are dependent on the Alaska Power & Telephone (AP&T) powerhouse located in Allakaket with an overhead 7.2 kW power line that crosses the Koyukuk River. There is a small backup generator in Alatna, however, the logistics and costs of transporting fuel between the villages makes the Alatna plant cost-prohibitive to operate. Every year the Allakaket overhead line tower structure was threatened and damaged by the river breakups and flooding which resulted in constant repair work. The river cut in a huge, new channel during the spring 2004 breakup, washing away the supporting gravel structure, leaving the pole leaning precariously. In the period of six years the structure on the Allakaket side was washed out twice during breakup.

Activities

The leaning tower pole was temporarily stabilized while different avenues of eliminating this constant problem were examined. After exhaustive investigation, the decision was made to install underground primary lines fifteen feet below the riverbed to allow for future erosion problems. AP&T contracted with Alaska Road Boring Company, of Anchorage, Alaska, an underground boring specialty company. After site visits with Alaska Road Boring Company, boring from Allakaket to Alatna was chosen as best procedure and materials necessary identified. Acquired project materials and Alaska Road Boring equipment and crew were shipped into Allakaket by air. Two AP&T personnel joined Alaska Road Boring Company crews on the project.

Both crews faced with a major logistics problems transporting everything three miles from the airstrip to the river. The City of Allakaket provided a loader to move material and equipment down to the Koyukuk River which proved unreliable and time-consuming.

With winter setting in, boats were stored for the season creating an arduous ordeal of stringing the 5,000-pound reel of wire across the Koyukuk River. The cable was pulled across the river full of huge ice chunks flowing downriver by using of the loader on the Allakaket side and a dozer on the Alatna side.

The boring and pulling primary cable across the river was completed October 26, 2004. Winter's cold temperatures precluded activating the newly install electric connection between the two villages until May 2005. An AP&T power crew returned to Allakaket finishing the connections on each side of the Koyukuk River. They also heated up the underground cable to complete and terminate. Due more than five feet of remaining snow and standing water from the start of breakup, the crew conducted only a portion allowable under the conditions. In August, the power crew finished the required work at the junction boxes completing this project.

Project Cost:

Denali Commission Grant	$361,380
Alaska Power & Telephone	$73,294
Total Project Budget	$434,674
Labor Costs	$6,452
Alaska Road Boring Company	$400,000
Other Materials	$15,355
Vehicle Costs	$2,239
Total Project Cost	$424,046

Project Outcomes:

The underground bore has alleviated the constant consternation and expenses of maintaining the river crossing tower poles. This accomplished by reducing dangers associated with ice break-up and river flooding. It further eliminates the need to replenish gravel around the structure and supporting guying system. For a number of years acquisition of gravel has been difficult and costly.

The underground system provides reliability by reducing susceptible to ice loads to pulling connectors apart and line slap that result in power outages. Other structures also benefit from reduced ice loading and flood related support degradation. The increased reliability also alleviates fuel transportation to the Alatna backup generator and associated difficulties.

Problems Encountered:

- Boring tips broke three times during the boring process necessitating their replacement.
- After the bore, the conduit broke while pulling it through the bore.
- When the line was snagged, approximately 1/3 of the way through, a new route was bored and the line pulled.

- A third bore was started, but delayed all boring mud was used. More boring mud was flown into the village. The conduit and cable pull were successful in this bore.
- Construction was slowed by extreme conditions:
    - Heavy snowfall
    - Temperatures were in the –20's Fahrenheit
    - High winds
    - The middle of the river was still flowing with huge ice chunks
    - The edges of the river was freezing so a boat could not be used
    - The shoreline ice was not thick enough to support weight
    - Lack of decent housing facilities required Alaska Road Boring crew stay in a tent near their equipment and AP&T crew stay on the floor of a shack.
    - Food service was unavailable. The crews were forced to bring and prepare their own food without kitchen facilities.

Conclusions and Recommendations:

Replacing the overhead line with underground after losing the first structure would have eliminated the annual expense, consternation, and constant search for natural supporting materials that marked this line for years. Funding was not available to install the facility underground.